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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,482	11/26/2001	Lorthar Diehl	10191/1897	2543

26646 7590 02/14/2003

KENYON & KENYON
ONE BROADWAY
NEW YORK, NY 10004

EXAMINER
TUNG, TA HSUNG

ART UNIT	PAPER NUMBER
1753	7

DATE MAILED: 02/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

53

Office Action Summary

Application No.	Applicant(s)	
09/913,482	DICHL, L.	
Examiner	**Group Art Unit**	**Paper No.**
T. TUNG	1743	7

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☑ Claim(s) 22-44 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☑ Claim(s) 22-44 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☑ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☑ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☐ Other _____

Office Action Summary

Claims 22-44 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. .

The disclosure is confusing in that the electrode lead apparently has a lesser ion conductivity than the electrode, but at the same time a lesser electrical resistance than the electrode. What material(s) of the electrical lead would have those properties simultaneously? For example, alumina has virtually no ion conductvity, but it also has a high electrical resistance.

The discussion in the paragraph connecting pages 2 and 3 of the specification is also confusing in that is appears to call for the electrode lead to have significantly higher internal resistance than the electrode, but at the same time the electrode lead's internal resistance is also reduced somehow. Further, a higher internal resistance for the electrical lead compared to that of the electrode would appear to contradict claims 33 and 44.

Claims 22-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22, the wording in the last paragraph is vague. It would appear that the language includes the situation wherein there is a minute amount of a non-ionic conductor (e.g. alumina) in the electrode lead, albeit the overall ionic conductivity of the electrode lead may be more than that of the electrode.

For example, the electrode lead may contain an amount X of an ion conductor A, while the electrode contains an amount Y of a different ion conductor B. Assume that B has an ion conductivity higher than that of A. However, if Y is significantly less than X, the net result may be that the electrode would have a lesser ion conductivity than the electrical lead. This situation is embraced by applicant's claim language, even though it is clearly antithetical to the gist of the invention.

Similarly, in claim 33, the last paragraph wording embraces the situation wherein the electrode may contain a material that has a higher resistivity than that of a material in the electrical lead, but because its amount is significantly less than that of the material in the electrical lead, the electrical lead can end up with an overall higher resistance than the electrode. That scenario would appear to be antithetical to applicant's invention.

Claim 44, lines 6-9 are vague. It is unclear if the material recited in lines 6-7 is the same material as that recited in lines 8-9. If yes, the same material would have lesser ion conductivity but also lesser resistivity. It is not evident what such a material would be. Alumina has virtually no ionic conductivity, but it has very high electrical resistance.

Claims 32 and 43, last line does not read correctly. It is not evident what is the subject of the verb "including....".

Claims 27 and 38, line 2, "increased porosity" is indefinite because the standard by which the increase is determined is not specified.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22, 23, 25, 27, 28, 31-34, 36, 38, 39, 42-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Kato etal 4,668,375.

Kato discloses a solid electrolyte sensor comprising a heater and an electrode 11 with a lead 13-16-18. Layer 18 has a metal content higher than portions 13, 16 as well as electrode 11 (which presumably has the same metal content as portions 13, 16). See col. 4, lines 3-65 and col. 5, lines 24-46.

Kato also discloses a second embodiment (fig. 3) in which layer 31 underneath layer 13 has a higher ceramic content than layer 13. See col. 6, lines 15-49. In this case, layer 31 can be regarded to be the electrode, while layer 13, with the higher metal content, would be the lead. The fact that Kato does not intend layer 31 to be an electrode is irrelevant, because layer 31 is a conductor and is capable of acting as an electrode.

In regard to claim 27, electrodes in solid electrolyte gas sensors are typically porous so as to permit a sample gas to reach the electrolyte through the electrodes. Therefore, the Kato electrode 11 is presumably porous. As for the term "as a result of adding a pore-forming

material", that is merely a product-by-process expression. The pore-forming material would not even be present in the final product.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 26, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato etal '375.

These claims differ by calling for the electrode lead to have a ceramic content of 20 volume percent zirconia.

Kato discloses zirconia volume percent of 40 and 10 at col. 5, lines 24-46. The value of 20 volume percent is between these two values and would have been obvious in the absence of unexpected result. There is no evidence of any unexpected result in the instant case.

Claims 24, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato etal '375 in view of Radford etal 3,843,400 or Haecker etal 4,283,441.

These claims differ by calling for electrode lead to contain 5-10 percent of alumina.

Radford discloses incorporating 5% of alumina to a stabilized zirconia as a sintering aid. See col. 3, lines 5-10. Haecker discloses adding alumina to a cermet electrode composition. See col. 2, lines 23-46. It would have been obvious for Kato to add alumina to the ceramic

component of the electrical lead in view of Radford or Haecker, since the ceramic component comprises zirconia, the same as the ceramic to which alumina is added in Radford or Haecker, and would be expected to benefit from alumina as a sintering aid.

Claims 27, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato etal '375 in view of Schnaibel etal 6,346,277.

These claims differ by calling for the electrode to have pores made by a pore-forming material.

Schnaibel discloses it to be well-known to provide pores by first adding and then decomposing a pore-forming material. See col. 3, lines 30-43. It would have been obvious for Kato to derive pores in its electrode from a pore-forming material in view of Schnaibel. The incorporation of known features from analogus prior art is within the skill of the art in the absence of unexpected result.

Claims 30, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato etal '375 in view of Iino etal 4,943,330 or Kojima etal 5,895,591.

These claims differ by calling for the heater to be in the same layer plane as an electrode.

Iino in figure 9 appears to disclose an electrode 108 in the same layer plane as a heater 130. See col. 13, lines 12-29. Kojima (figure 6) appears to disclose electrodes 35 on the same layer plane as a heater 32. See col. 6, lines 46-65. It would have been obvious for Kato to place the heater in a same layer plane as an electrode in view of the secondary references in order to save space and material cost.

Claims 22, 32 are rejected under 35 U.S.C. 102(b) as being anticpated by Friese etal 5,662,786 or Friese etal 5,435,901.

Friese '786 discloses an outer electrode 1 with a lead made of a cermet comprising zirconia and platinum. See col. 3, lines 53-67. The electrode is presumably made of platinum, as electrodes for solid electrolyte sensors are typically made of (see col. 1, line 31 of the patent). Friese '901 also discloses an outer electrode 2 with a lead made of a cermet comprising zirconia and platinum. See col. 3, lines 29-44. Electrode is presumably made of Pt (see col. 1, line 36). In either Friese, the zirconia has an ion conductivity lesser than the Pt metal of the electrode.

Claims 22, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friese etal '786 or Friese etal '901 in view of Kato etal 4,588,494 or Sano etal 4,379,741.

If the Friese patents were construed as not to disclose the outer electrode to be made of Pt, applicant's claims differ in that respect.

Kato '494 discloses Pt to be a common electrode material for a solid electrolyte sensor. See col. 4, line 55. Sano also discloses Pt to be a common electrode material for a solid electrolyte sensor. See col. 1, line 54. It would have been obvious for either Friese patents to addopt Pt as the material for its outer electrode, since the incorporation of known features from analogous prior art is within the skill of the art in the absence of unexpected result.

DE 19837607, cited in the IDS of Aug. 15, 2001 has been considered to the extent of its drawings.

The examiner can be reached at 703-308-3329. His supervisor Nam Nguyen can be reached at 703-308-3322. Any general inquiry should be directed to the receptionist at 703-308-0661. A fax number for TC 1700 is 703-872-9310.

Ta Tung

Primary Examiner

Art Unit 1753